

I. Sirex noctilio



Risk Mapping for the Invasive Woodborer; *Sirex noctilio*

Presentation by: Marla C. Downing
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Forest Health Technology Enterprise
Team, (FHTET)
Fort Collins, CO

I. Sirex noctilio



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I. Sirex noctilio



Commodities

- Bricks
- Cargo
- Coniferales
- Crating
- Dunnage
- Glass
- Granite
- Iron
- Ironware
- Lumber
- Machinery
- Marble
- Metalware
- Miscellaneous *Crating
- Miscellaneous Cargo
- Musa Sp,
- Pallets
- Parts
- Pinus Sp.
- Quarry product
- Sageretia thea
- Slate
- Steel
- Stones
- Tiles
- Wood

Sirex noctilio Susceptibility



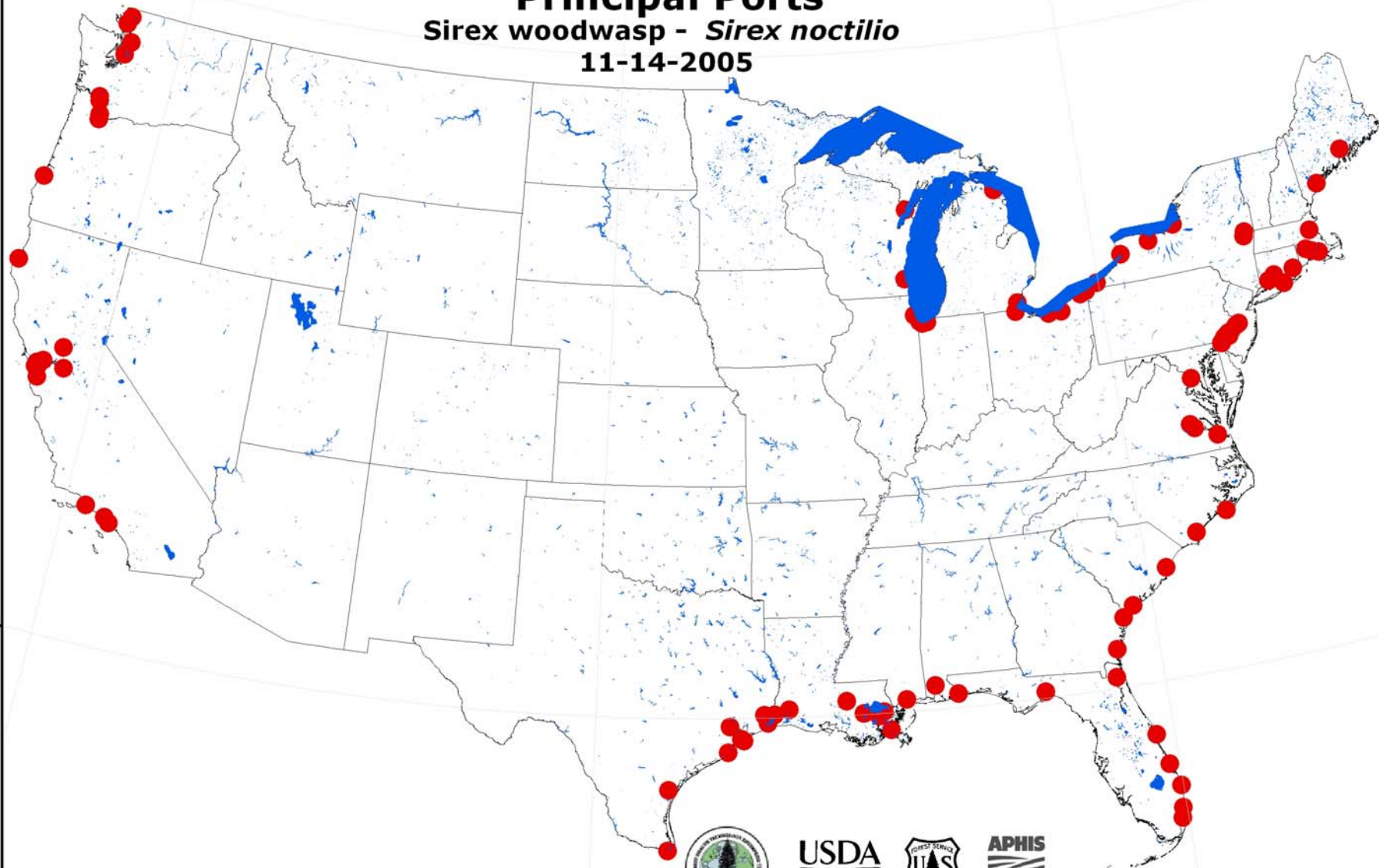
- Introduction Potential
 - Associated commodities
 - Countries with *S. noctilio* present
 - Ports of entry and Destinations
- Establishment Potential
 - Host species presence
 - High basal area densities
 - Soil Wetness Dryness Index

Commodities Likely Associated Solid Wood Packing Material and therefore, *Sirex noctilio*

- Bricks
- Cargo
- Coniferales
- Crating
- Dunnage
- Glass
- Granite
- Iron
- Ironware
- Lumber
- Machinery
- Marble
- Metalware
- Miscellaneous *Crating
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- Steel
- Stones
- Tiles
- Wood

Principal Ports

Sirex woodwasp - *Sirex noctilio*
11-14-2005



Legend

● Principal Ports

■ Water

file:principal_ports3.mdx



180 90 0 180 360 540 720 900

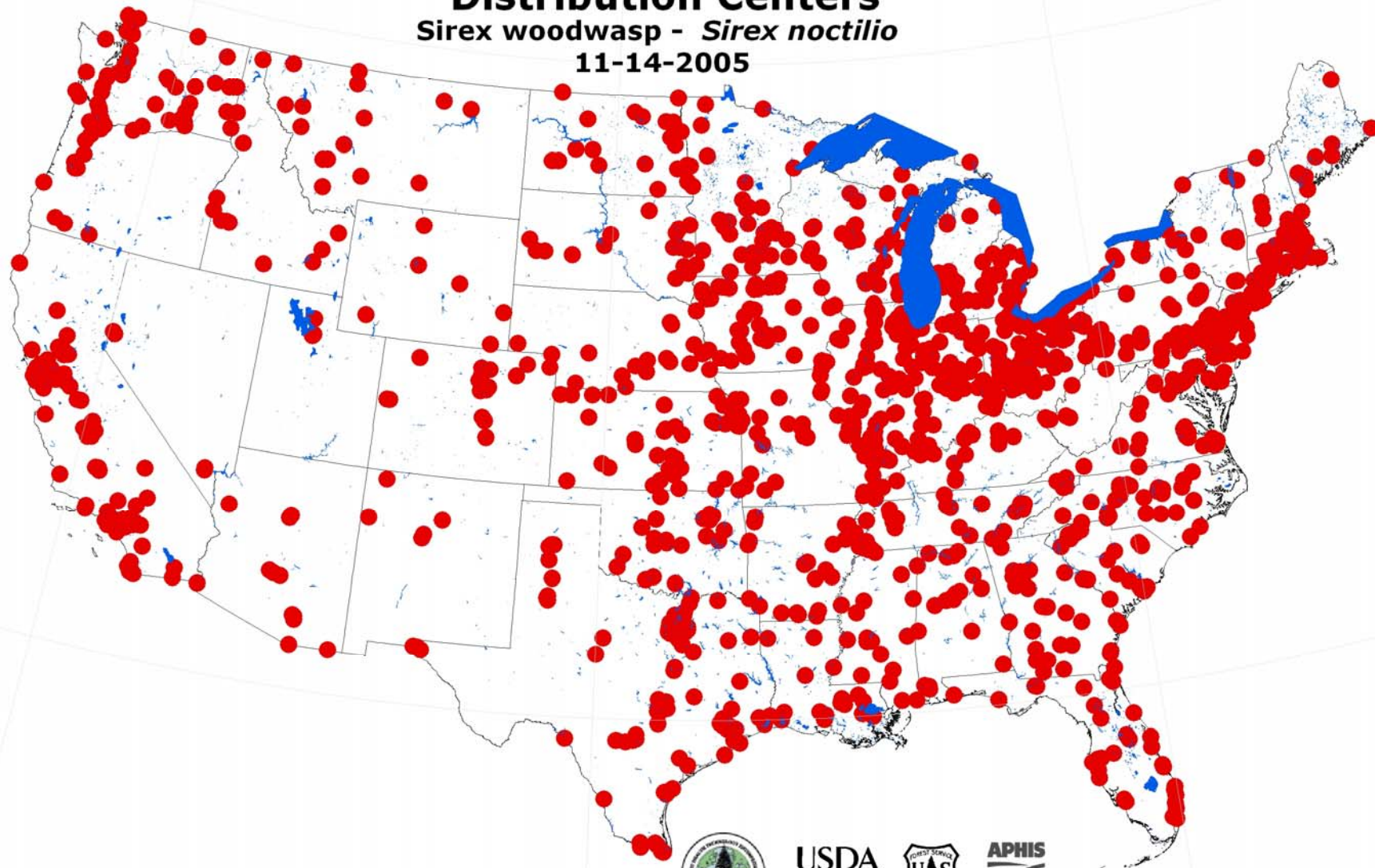
Kilometers

Albers Equal Area Conic Projection

Map Produced by FHTET
Fort Collins, CO on 1-10-2006. MFT

Distribution Centers
Sirex woodwasp - Sirex noctilio
11-14-2005

30°N



Legend

● Distribution Centers

■ Water



180 90 0 180 360 540 720 900

Kilometers

Albers Equal Area Conic Projection

Map Produced by FHTET
Fort Collins, CO on 1-10-2006. MFT

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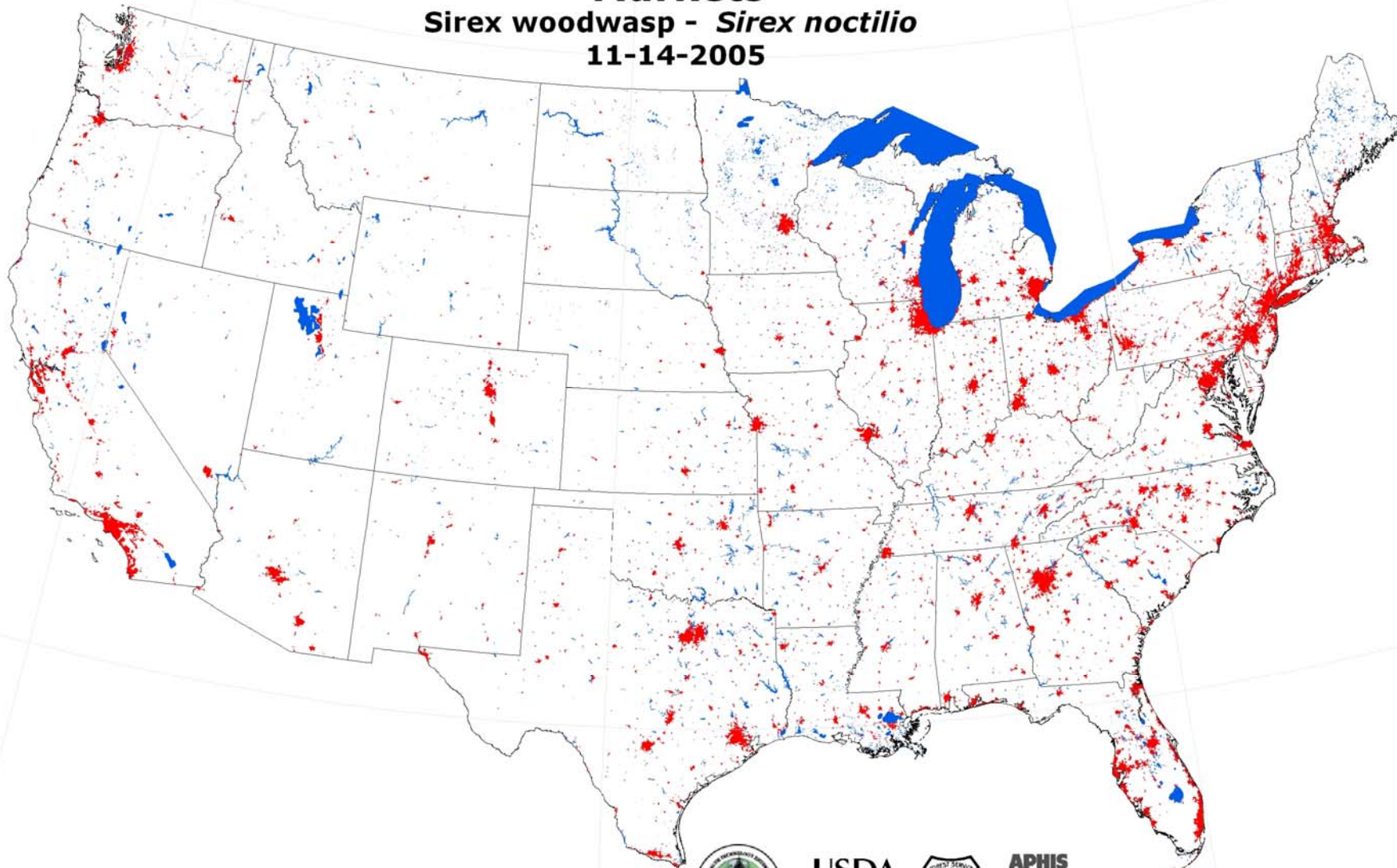
100°W

80°W

Markets

Sirex woodwasp - Sirex noctilio

11-14-2005



Legend

- Markets
- Water

file: markets3.mdx



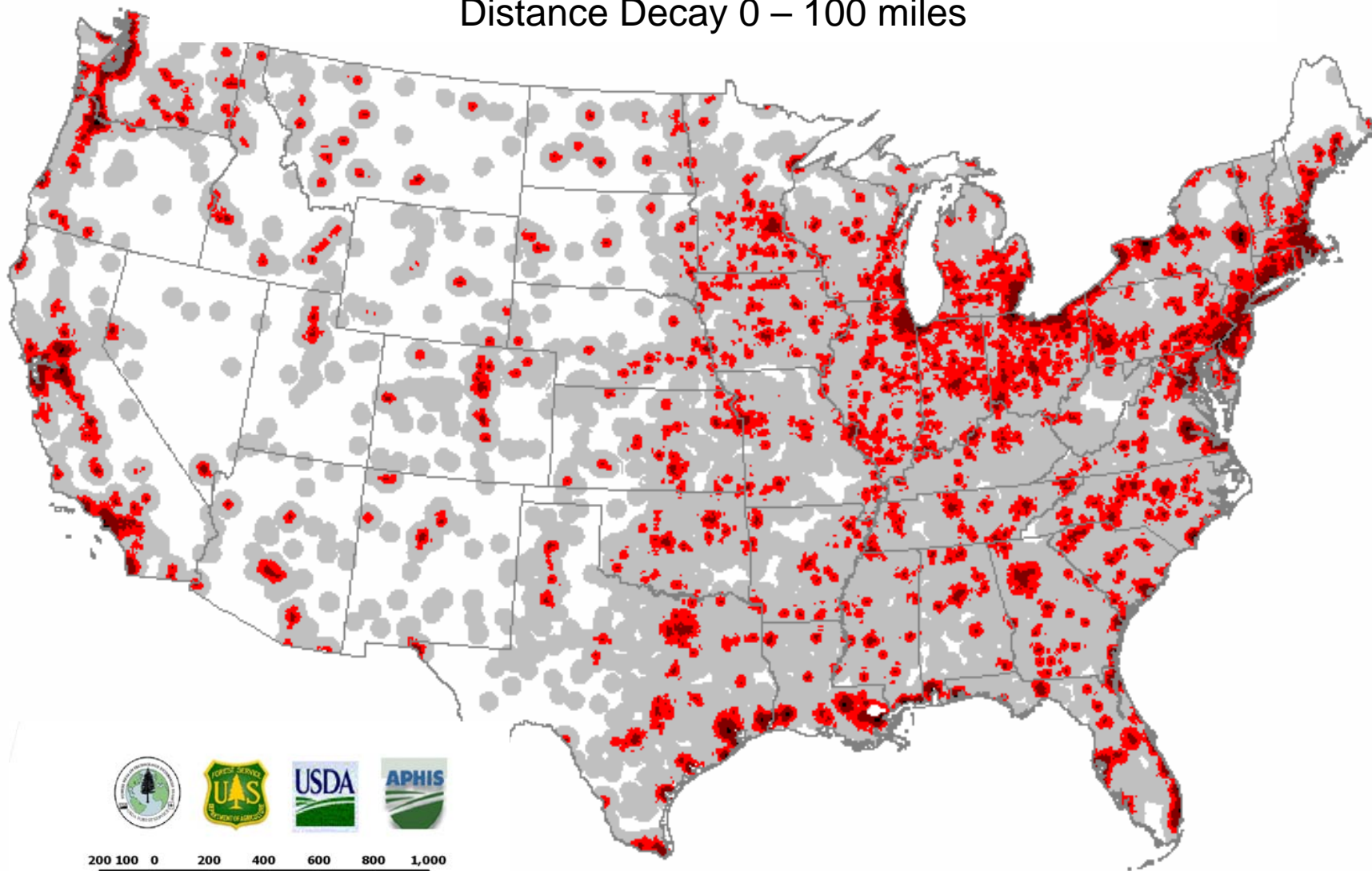
170 85 0 170 340 510 680 850
Kilometers

Albers Equal Area Conic Projection

Map Produced by FHTET
Fort Collins, CO on 1-10-2006. MFT

Ports and Destinations: *Sirex noctilio*

Distance Decay 0 – 100 miles



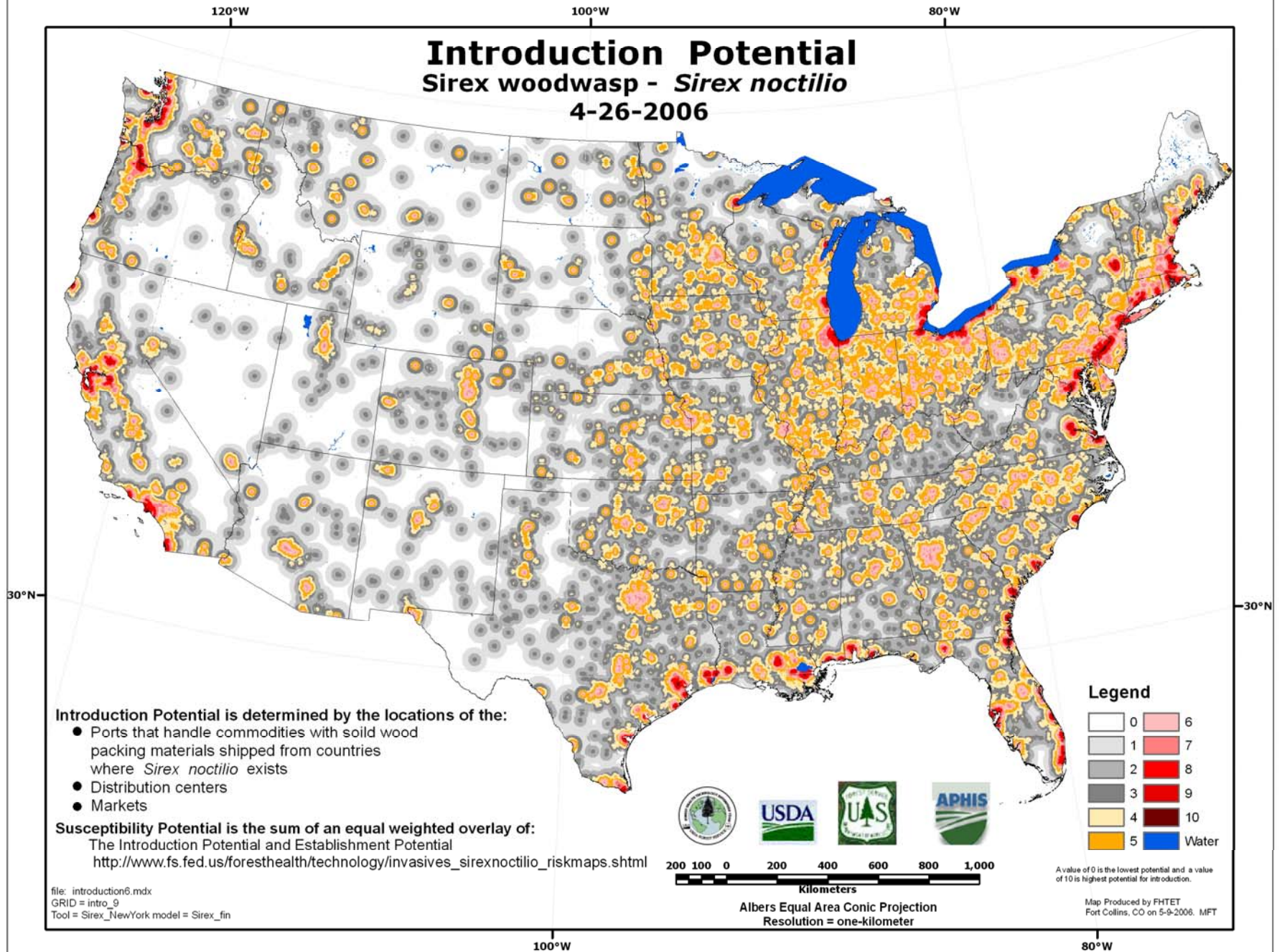
200 100 0 200 400 600 800 1,000
Kilometers

Albers Equal Area Conic Projection

Introduction Potential

Sirex woodwasp - *Sirex noctilio*

4-26-2006



Sirex noctilio Susceptibility



- Introduction Potential
 - Associated commodities
 - Countries with *S. noctilio* present
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- Establishment Potential
 - Host species presence
 - High basal area densities
 - Soil Wetness Dryness Index

Host Species Susceptibility to *Sirex noctilio* Attack:

VERY HIGH

Austrian pine
Monterey pine
loblolly pine
Scotch pine

HIGH

lodgepole pine
Jack pine
Jeffrey pine
ponderosa
pine
red pine
shortleaf pine
slash pine
Virginia pine

MEDIUM

knobcone pine
sand pine
Apache pine
spruce pine
bishop pine
longleaf pine
Table
Mountain
pine
pitch pine
pond pine
Washoe pine

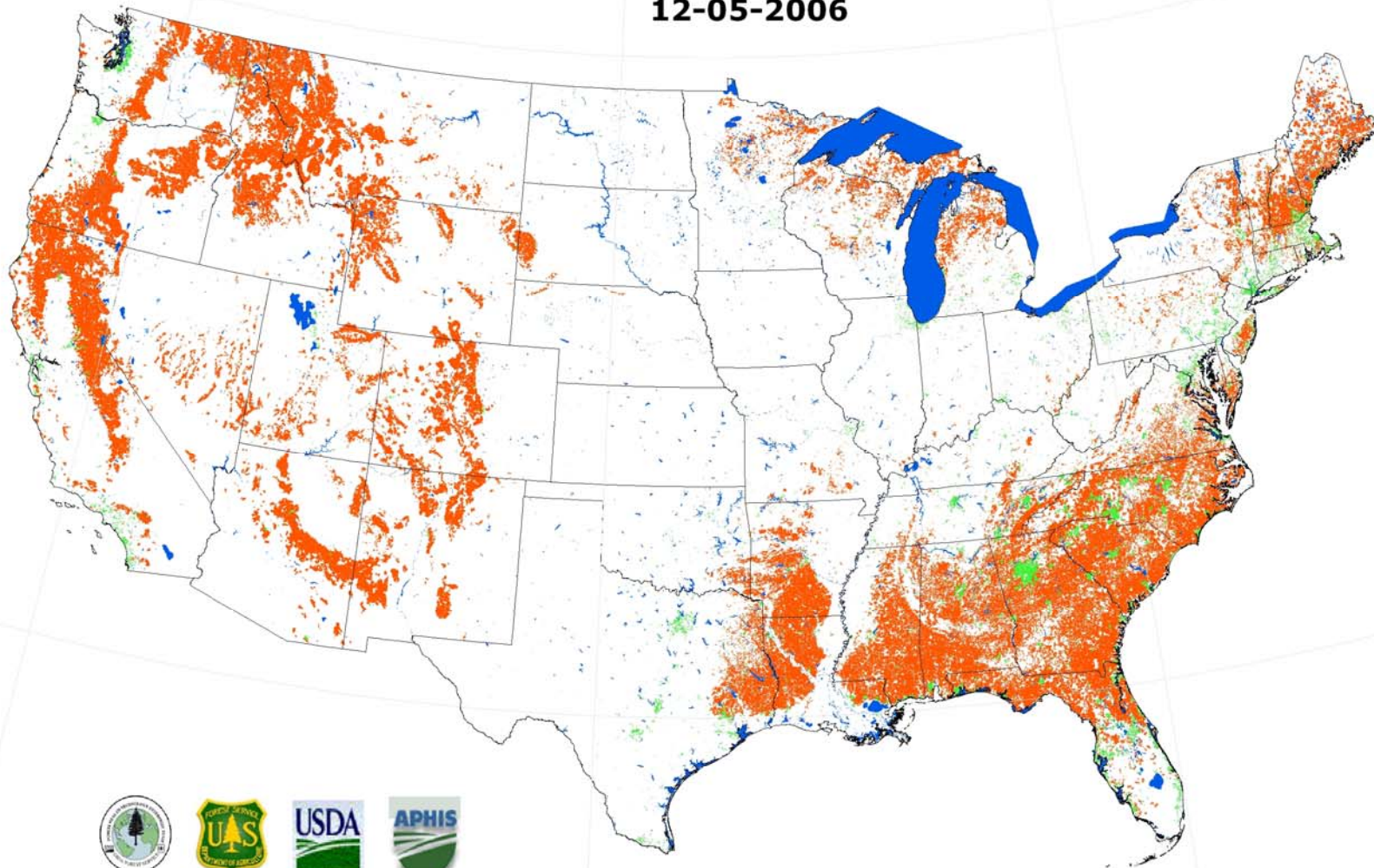
LOW

white bark
pine
foxtail pine
common
pinyon
Coulter pine
limber pine
Southwestern
white pine
sugar pine
Chihuahua
pine
western white
pine
gray pine

LOW cont.

Mexican pinyon
pine
Great Basin
bristlecone
Arizona pinyon pine
Arizona pine
eastern white pine
singleleaf pinyon
border pinyon
four-needle pinyon
Torrey pine

Potential Host
Sirex woodwasp - *Sirex noctilio*
12-05-2006



200 100 0 200 400 600 800 1,000
Kilometers

Albers Equal Area Conic Projection

- NLCD
- FIA Pine
- Water

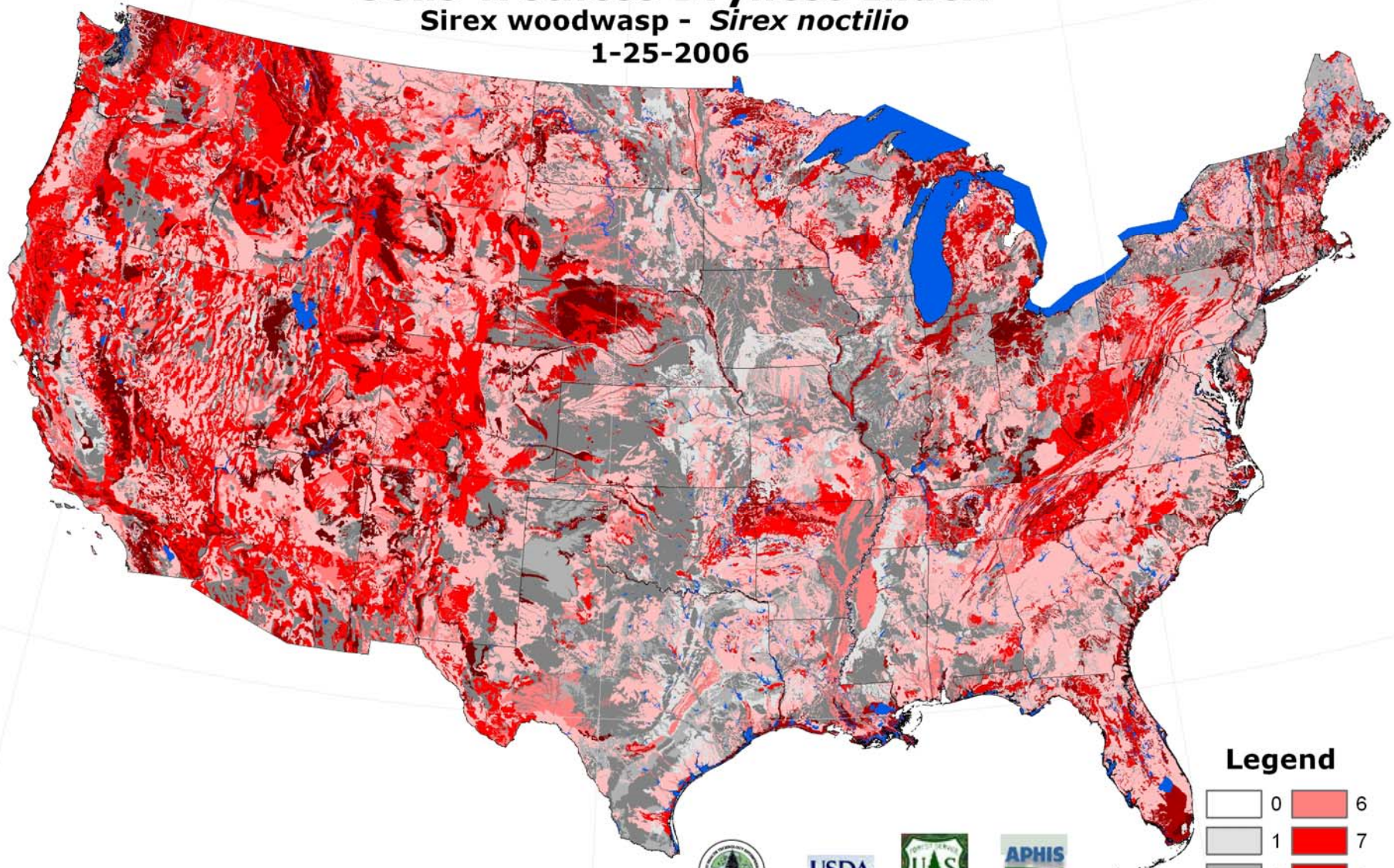
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Map Produced by FHTET
Fort Collins, CO on 12-05-2006. MFT
File:host.mdx

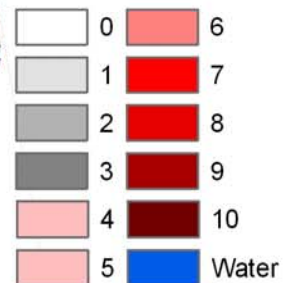
Soils Wetness Dryness Index

Sirex woodwasp - *Sirex noctilio*

1-25-2006



Legend



Data Authors:

Frank Krist, USDA Forest Service, FHTET
Randall J. Schaetzl, Michigan State University



Albers Equal Area Conic Projection

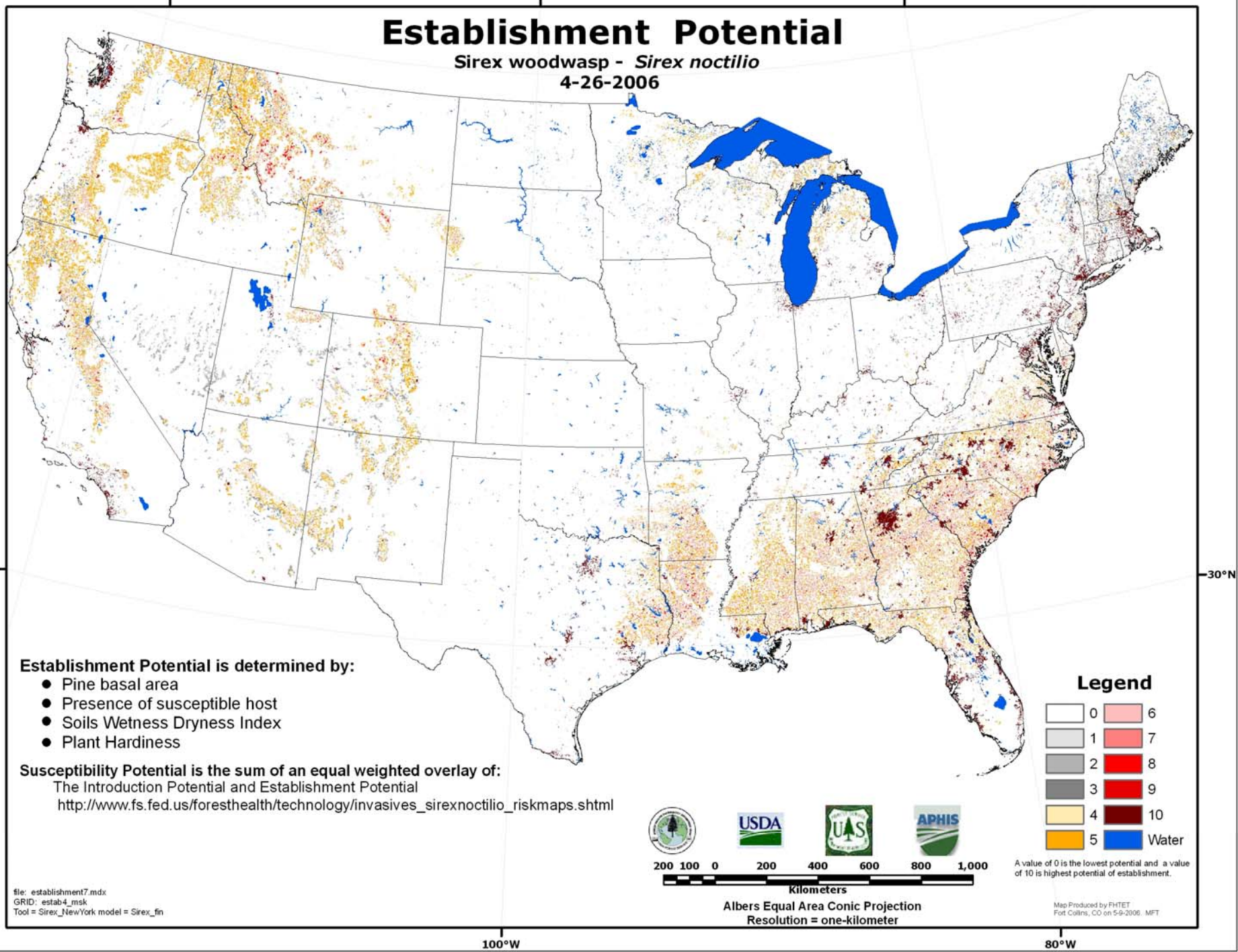
Map Produced by FHTET
Fort Collins, CO on 1-25-2006. MFT

A value of 0 is optimum soil moisture and a value of 10 is bare rock and or super-saturated soils.

Establishment Potential

Sirex woodwasp - *Sirex noctilio*

4-26-2006



Sirex noctilio Susceptibility



Diagram illustrating the workflow for *Sirex noctilio* susceptibility analysis using ArcGIS.

The workflow involves two main input rasters:

- pine_total_ba** (Green oval)
- statsgo_di1 km** (Blue oval)

Both rasters are processed through a **Reclassify** step (yellow rectangles).

The **Reclassify (4)** dialog box is shown, detailing the reclassification process for the **pine_total_ba** raster.

Reclassify (4) Dialog Box Details:

- Input raster:** pine_total_ba
- Reclass field:** Value
- Reclassification Table:**

Old values	New values
16 - 29	3
29 - 44	4
44 - 62	5
62 - 82	6
82 - 106	7
106 - 136	8
136 - 181	9
181 - 331	10

Buttons: Classify..., Unique, Add Entry, Delete Entries, Load..., Save..., Reverse New Values, Precision...

Output raster: I:\US_GIS_Data\workarea\pine_sirex10b\temp\pn_total_rcl

☒ Change missing values to NoData

Buttons: OK, Cancel, Apply, Show Help

Sirex noctilio Susceptibility



sirex_fin

Model Edit View Window Help

Model diagram showing three input rasters (pine_base1 (2), pn_total_rcl, soil_wdi) feeding into a Weighted Overlay (2) process.

Weighted Overlay (2)

Weighted overlay table

Raster	% Influence	Field	Scale Value
pine_base1 (2)	40	Value	
		0	NODATA
		1	1
		5	5
		7	7
		10	10
pn_total_rcl	40	NODATA	NODATA
		Value	
		0	0
		1	1
		2	2
		5	5
soil_wdi	20	8	8
		9	9
		10	10
		NODATA	NODATA
		Value	
		0	0
		1	1

Sum of influence: 100

Set Equal Influence

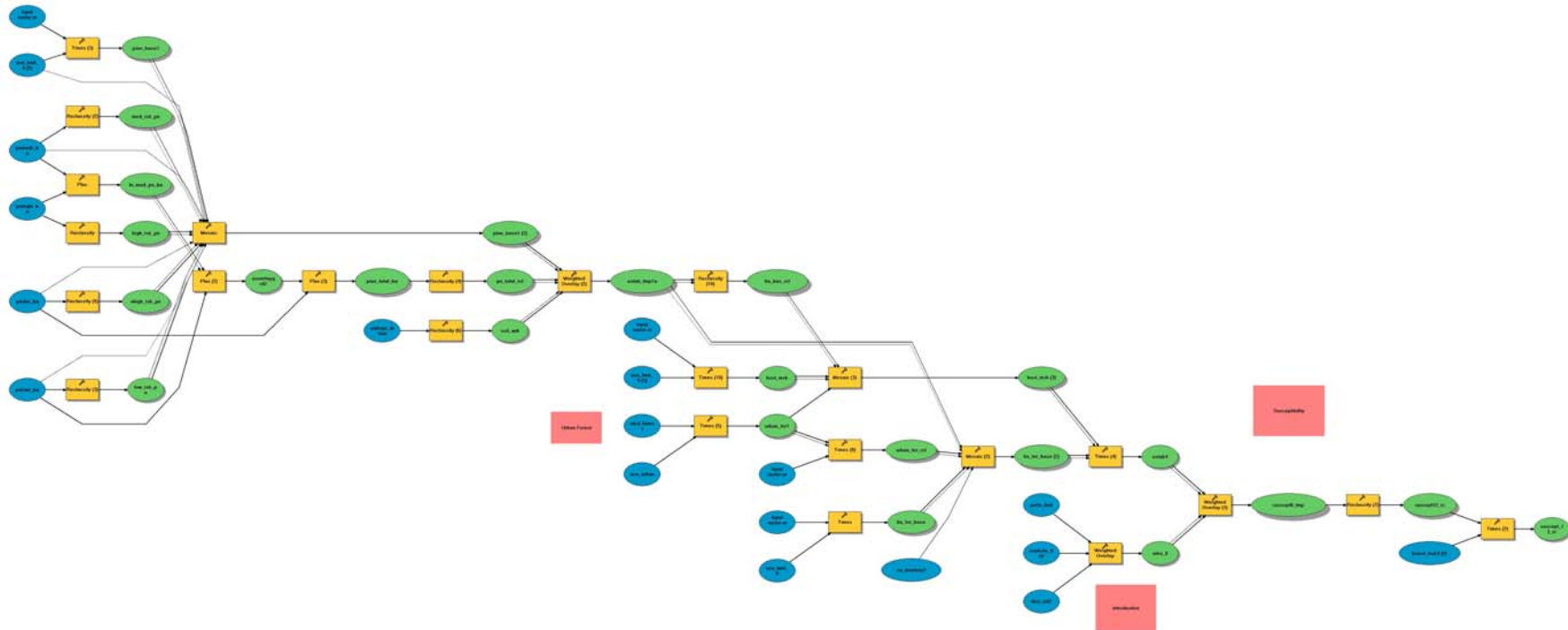
Evaluation scale: 0 to 10 by 1

From To By

OK Cancel Apply Show Help >>

Windows taskbar: start, Inbox - Microsoft Out..., susceptibility6_soils..., I:\US_GIS_Data\work..., Document2 - Microsof..., 10:05 AM Monday 12/11/2006

Sirex noctilio Susceptibility



120°W

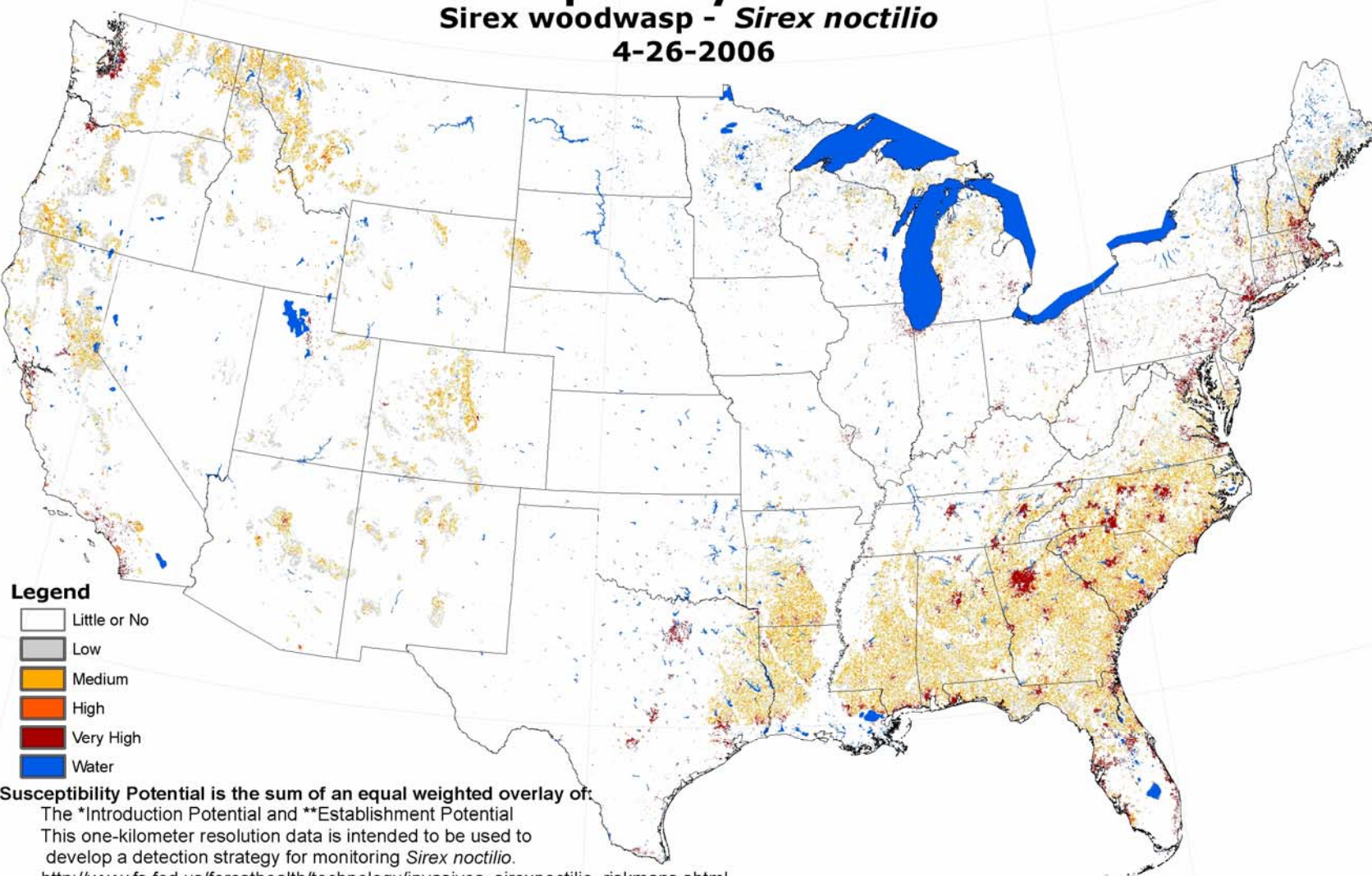
100°W

80°W

Susceptibility Potential

Sirex woodwasp - *Sirex noctilio*

4-26-2006



Legend

- Little or No
- Low
- Medium
- High
- Very High
- Water

Susceptibility Potential is the sum of an equal weighted overlay of:

The *Introduction Potential and **Establishment Potential

This one-kilometer resolution data is intended to be used to develop a detection strategy for monitoring *Sirex noctilio*.

http://www.fs.fed.us/foresthealth/technology/invasives_sirexnoctilio_riskmaps.shtml

***Introduction Potential is determined by the locations of the:**

- Ports that handle commodities with solid wood packing materials shipped from countries where *Sirex noctilio* exists.
- Distribution centers
- Markets

****Establishment Potential is determined by:**

- Pine basal area
- Presence of susceptible host
- Soils Wetness Dryness Index
- Plant Hardiness



Albers Equal Area Conic Projection

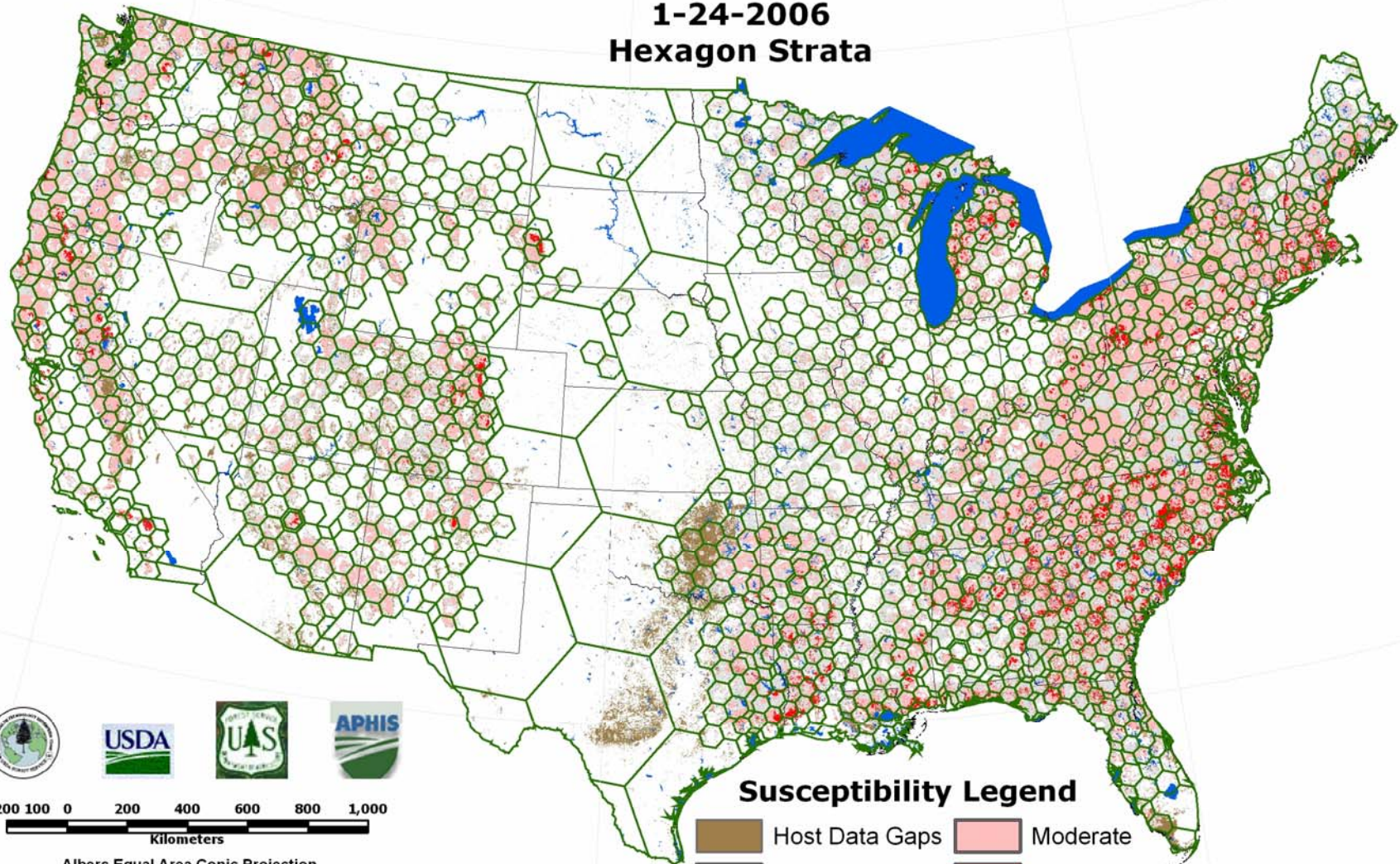
Map Produced by FHTET
Fort Collins, CO on 5-8-2006. WFT
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GR ID: suscept13_rc
Tool = Sirex_NewYork_model = Sirex_fm

Susceptibility Potential

Sirex woodwasp - Sirex noctilio

1-24-2006

Hexagon Strata



Susceptibility Potential is the sum of an equal weighted overlay of :
The Introduction Potential and Establishment Potential.

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Product URL:

[http://www.fs.fed.us/foresthealth/
technology/products.shtml](http://www.fs.fed.us/foresthealth/technology/products.shtml)

Photos URL:

<http://www.forestryimages.org/images/>

Exotic Forest Pest (ExFor) Risk URL:

<http://www.spfnic.fs.fed.us/exfor/>